

PATENT COOPERATION TREATY

PCT

REC'D 23 MAR 2001

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference BB1313	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/30181	International filing date (day/month/year) 17/12/1999	Priority date (day/month/year) 18/12/1998
International Patent Classification (IPC) or national classification and IPC C12N15/29		
Applicant E. I. DU PONT DE NEMOURS AND COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
 - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 10/07/2000	Date of completion of this report 21.03.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Claes, B Telephone No. +49 89 2399 8429 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US99/30181

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

1-28 as originally filed

Claims, No.:

1-23 as originally filed

Sequence listing part of the description, pages:

1-40, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☒ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/30181

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):
- (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application.
- ☒ claims Nos. 1-23 (partially).

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 1-23 (partially).
2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:
- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-15,18-23
	No: Claims 16,17
Inventive step (IS)	Yes: Claims

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/30181

	No:	Claims	1-23
Industrial applicability (IA)	Yes:	Claims	1-23
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US99/30181

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. This report pertains to the claims restricted to subject matter related to SEQ IDs Nos 1 and 2. For the other claimed subject matter no search report has been established.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The following documents are referred to:

D1: WO 98 04586 A (INNES JOHN CENTRE INNOV LTD ;PANSTRUGA RALPH (GB); BUESCHGES RAINE) 5 February 1998 (1998-02-05)

D2: BUESCHGES R ET AL: 'THE BARLEY MLO GENE: A NOVEL CONTROL ELEMENT OF PLANT PATHOGEN RESISTANCE' CELL, vol. 88, no. 5, 7 March 1997 (1997-03-07), pages 695-705, XP002035301 ISSN: 0092-8674 cited in the application

2. D1 identifies Barley Mlo genes and provides a method of identifying and cloning homologues from other species than Barley. From the application, in example 2, it can be taken that also Arabidopsis Mlo homologues had been known in the art.

The presently claimed subject matter is merely the provision of a nucleotide sequence encoding a further Mlo homologue presumably from Rice.

In view of the disclosure in D1 (as well as D2) the identifies sequences ID Nos 1 and 2 cannot, in the absence of any surprising effect, be acknowledged to involve an inventive step as they are the mere result of the routine experimentation as suggested in D1.

Consequently the subject matter of claims 1-23 does not comply with Article 33(3)

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

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3. Rice plants comprising DNA of SEQ ID 1 or the polypeptide of SEQ ID 2 had been known in the art. Consequently, the subject matter of claims 16 and 17 lacks novelty under Article 33(2) PCT.

Re Item VI

Certain published documents (Rule 70.10)

WO00/01722 published on 13.01.2000

Re Item VIII

Certain observations on the international application

1. Claim 11 part (a) does not necessarily refer to 30 contiguous nucleotides as derived from SEQ ID 1 as claim 1 is not restricted to such. Consequently, claim 11 lacks essential technical features.

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Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
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EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/30181

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/29 C07K14/415 C12N5/10 C12Q1/68 C12N15/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 98 04586 A (INNES JOHN CENTRE INNOV LTD ;PANSTRUGA RALPH (GB); BUESCHGES RAINE) 5 February 1998 (1998-02-05) page 1, line 13 - line 16 page 2, line 7 - line 17 page 4, line 24 -page 8, line 15 page 11, line 15 -page 12, line 6 figures 8,10,13 Seq Id Nos 11, 18, 56 --- -/-</p>	1-23

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

30 May 2000

Date of mailing of the international search report

25.8.00

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
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Authorized officer

CEDER O.

INTERNATIONAL SEARCH REPORT

Intern. Patent Application No.
PCT/US 99/30181

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>BUESCHGES R ET AL: "THE BARLEY MLO GENE: A NOVEL CONTROL ELEMENT OF PLANT PATHOGEN RESISTANCE" CELL, vol. 88, no. 5, 7 March 1997 (1997-03-07), pages 695-705, XP002035301 ISSN: 0092-8674 cited in the application abstract page 695, right-hand column, paragraph 2 page 701, left-hand column, paragraph 1</p>	1-23
E	<p>WO 00 01722 A (PIONEER HI BRED INT ;BRIGGS STEVEN P (US); SIMMONS CARL R (US)) 13 January 2000 (2000-01-13) abstract page 4, line 1 - line 20 Seq Id Nos 3,4</p>	1-23

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 1,2.

2. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 3,4.

3. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 5,6.

4. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 7,8.

5. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 9,10.

6. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 11,12.

7. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 13,14.

8. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 15,16.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

9. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 17,18.

10. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 19,20.

11. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 21,22.

12. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 23,24.

13. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 25,26.

14. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 27,28.

15. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 29,30.

16. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 31,32.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

17. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 33,34.

18. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 35,36.

19. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 37,38.

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-23 ALL PARTLY

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/30181

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9804586 A	05-02-1998	AU 3702897 A	20-02-1998
		CA 2260363 A	05-02-1998
		CN 1231673 A	13-10-1999
		EP 0917536 A	26-05-1999

WO 0001722 A	13-01-2000	AU 4862699 A	24-01-2000
		AU 4971299 A	24-01-2000
		WO 0001721 A	13-01-2000

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification n ⁷ : C12N 15/29, C07K 14/415, C12N 5/10, C12Q 1/68		A2	(11) International Publication Number: WO 00/36110
			(43) International Publication Date: 22 June 2000 (22.06.00)
(21) International Application Number: PCT/US99/30181		(81) Designated States: AE, AL, AU, BA, BB, BG, BR, CA, CN, CR, CU, CZ, DM, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, SL, TR, TT, UA, US, UZ, VN, YU, ZA, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 17 December 1999 (17.12.99)		Published <i>Without international search report and to be republished upon receipt of that report.</i>	
(30) Priority Data: 60/112,737 18 December 1998 (18.12.98) US			
(71) Applicant (for all designated States except US): E.I. DU PONT DE NEMOURS AND COMPANY [US/US]; 1007 Market Street, Wilmington, DE 19898 (US).			
(72) Inventors; and (75) Inventors/Applicants (for US only): CAHOON, Rebecca, E. [US/US]; 2331 West 18th Street, Wilmington, DE 19806 (US). MIAO, Guo-Hua [US/US]; 202 Cherry Blossom Place, Hockessin, DE 19707 (US). RAFALSKI, J., Antoni [US/US]; 2028 Longcome Drive, Wilmington, DE 19810 (US). FANG, Yiwen [CN/US]; 203 Louis Lane, Hockessin, DE 19707 (US). SAKAI, Hajime [DE/US]; 105 Banbury Drive, Wilmington, DE 19803 (US). TARMINO, Graziana [IT/US]; Apartment 3A, 1505 Delaware Avenue, Wilmington, DE 19806 (US).			
(74) Agent: FEULNER, Gregory, J.; E.I. Du Pont de Nemours and Company, Legal Patent Records Center, 1007 Market Street, Wilmington, DE 19898 (US).			

(54) Title: PLANT DISEASE RESISTANCE GENES

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SEQ ID NO:41 M-----GHGGE-----GMSLEFTPTWVAVGVCTVIVAI SLAVERLLH
SEQ ID NO:40 MITRSRCRRSLLWFLVFHGGATATGAPSGGKELSTPTWAVAVVCTFLILISHLLEKGLQ
SEQ ID NO:39 M-----SDKKG-VPARELPETPSWAVAVVFAAMVLVSVLMEHGLH
SEQ ID NO:42 M-----ADQ-----VKEKTLEETSTWAVAVVCFVLLLSIVIEKLIH
SEQ ID NO:08 M-----SGGGEE-----GATLEFTPTWVVAACFTVIVAI SLAAERLLH
SEQ ID NO:12 M-----AAGESSSSRDLDTPTWAVAAVCTVFILVSI ALEKSLH
SEQ ID NO:14 M-----GGGGEE-----GNNLEFTPTWVAVVCSVIVAASFAAERFLH
SEQ ID NO:28 M-----GG-----KTLQETPTWAVAVVCFVLLSISILIEHILH
SEQ ID NO:32 M-----AEDYEYPPARTLPETPSWAVALVFVAVMIIVSVLLEHALH
SEQ ID NO:38 M-----AGGGGK-----AKPLEYPTWIVALVCSVMIIISLLFERLLH
1

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60

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SEQ ID NO:41 YFGTVLKKKKQKPLYEALQKVKEELMLLGFISLLLTVFQGL-ISKFCVKENVLMHMLPCS
SEQ ID NO:40 RLANWLWKKHKNSLLEALEKIKAEMLLGFISLLLTFGG-PYILKICVPRKAALSMLPCL
SEQ ID NO:39 KLGHWFQHRHKKALWEALEKMKAEMLLVGFISLLLTVDPIIAKICISEDADVMWPCK
SEQ ID NO:42 KIGSWFKKKKKALYEALQKKEELMLLGFISLLLTVTQNG-ITKICVRPSLTLMHMLPCN
SEQ ID NO:08 YGGKFLKAKDQKPLYEALQKKEELMLLGFISLLLTVTQNG-ITKICVRPSLTLMHMLPCN
SEQ ID NO:12 KVGTVLQKKKKKALLEALEKVKAEMLLGFISLLLTFGQ-SYIVRICIPEKLADNMLPCP
SEQ ID NO:14 YGGKFLKRNQKPLYEALQKKEELMLLGFISLLLTITQNG-IIRICVPVGTWHMLPCS
SEQ ID NO:28 LIGKWLKKKHKRALCEALEKIKSELMLLGFISLLLTVGQG-LISRICISEKVAGTFHPCP
SEQ ID NO:32 KLGHWFHKKHKNALAEALEKIKAEMLLVGFISLLLAVTQDPISG-ICISEKAASIMRPCS
SEQ ID NO:38 RLKRLIRSRKKPLYEALLKVKEELMLLGFISLLLTVFQGP-MGKVCVSPSAMLHLQPCK

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(57) Abstract

This invention relates to an isolated nucleic acid fragment encoding an Mlo homolog. The invention also relates to the construction of a chimeric gene encoding all or a portion of the Mlo homolog, in sense or antisense orientation, wherein expression of the chimeric gene results in production of altered levels of the Mlo homolog in a transformed host cell.

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AUG 31 2000

From the INTERNATIONAL SEARCHING AUTHORITY

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THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:

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as of 10/3/00 L2T KL

DATE SEP 6 1 2000

Date of mailing
(day/month/year)

25/08/2000

Applicant's or agent's file reference

BB1313 PCT

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/US 99/ 30181

International filing date
(day/month/year)

17/12/1999

Applicant

E. I. DU PONT DE NEMOURS AND COMPANY et al.

- 1.
- ☒
- The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.**Where?** Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

TRB NOTED

For more detailed instructions, see the notes on the accompanying sheet.

- 2.
- ☐
- The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

- 3.
- ☐
- With regard to the protest**
- against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

- 4.
- Further action(s):**
- The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Chantal Meyer

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference BB1313 PCT	FOR FURTHER ACTION		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US 99/ 30181	International filing date (<i>day/month/year</i>) 17/12/1999	(Earliest) Priority Date (<i>day/month/year</i>) 18/12/1998	
Applicant E. I. DU PONT DE NEMOURS AND COMPANY et al.			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 1,2.

2. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 3,4.

3. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 5,6.

4. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 7,8.

5. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 9,10.

6. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 11,12.

7. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 13,14.

8. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 15,16.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

9. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 17,18.

10. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 19,20.

11. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 21,22.

12. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 23,24.

13. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 25,26.

14. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 27,28.

15. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 29,30.

16. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 31,32.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

17. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 33,34.

18. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 35,36.

19. Claims: 1-23 all partly

An isolated nucleic acid molecule encoding a Mlo homolog and an isolated Mlo homolog polypeptide and their uses, where their sequences are SEQ ID NOS 37,38.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 99/30181

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-23 ALL PARTLY

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

SCHAEFFER, Andrew, L.
E.I. Du Pont de Nemours and Company
Legal Patent Records Center
1007 Market Street
Wilmington, DE 19898
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)

11 September 2000 (11.09.00)

Applicant's or agent's file reference

BB1313 PCT

IMPORTANT NOTIFICATION

International application No.

PCT/US99/30181

International filing date (day/month/year)

17 December 1999 (17.12.99)

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

Name and Address

FEULNER, Gregory, J.
E.I. Du Pont de Nemours and Company
Legal Patent Records Center
1007 Market Street
Wilmington, DE 19898
United States of America

State of Nationality

State of Residence

Telephone No.

302-992-3749

Facsimile No.

302-773-0164

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address

SCHAEFFER, Andrew, L.
E.I. Du Pont de Nemours and Company
Legal Patent Records Center
1007 Market Street
Wilmington, DE 19898
United States of America

State of Nationality

State of Residence

Telephone No.

302-992-4926

Facsimile No.

302-773-0164

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Sean Taylor

Telephone No.: (41-22) 338.83.38

00857896 96825860

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 11 September 2000 (11.09.00)	
International application No. PCT/US99/30181	Applicant's or agent's file reference BB1313 PCT
International filing date (day/month/year) 17 December 1999 (17.12.99)	Priority date (day/month/year) 18 December 1998 (18.12.98)
Applicant CAHOON, Rebecca, E. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

10 July 2000 (10.07.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Sean Taylor Telephone No.: (41-22) 338.83.38
--	--

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/30181

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/29 C07K14/415 C12N5/10 C12Q1/68 C12N15/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 98 04586 A (INNES JOHN CENTRE INNOV LTD ;PANSTRUGA RALPH (GB); BUESCHGES RAINE) 5 February 1998 (1998-02-05) page 1, line 13 - line 16 page 2, line 7 - line 17 page 4, line 24 -page 8, line 15 page 11, line 15 -page 12, line 6 figures 8,10,13 Seq Id Nos 11, 18, 56 --- -/-</p>	1-23

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

30 May 2000

Date of mailing of the international search report

25. 8. 00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

CEDER O.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/30181

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>BUESCHGES R ET AL: "THE BARLEY MLO GENE: A NOVEL CONTROL ELEMENT OF PLANT PATHOGEN RESISTANCE"</p> <p>CELL,</p> <p>vol. 88, no. 5, 7 March 1997 (1997-03-07),</p> <p>pages 695-705, XP002035301</p> <p>ISSN: 0092-8674</p> <p>cited in the application</p> <p>abstract</p> <p>page 695, right-hand column, paragraph 2</p> <p>page 701, left-hand column, paragraph 1</p> <p style="text-align: center;">---</p>	1-23
E	<p>WO 00 01722 A (PIONEER HI BRED INT ;BRIGGS STEVEN P (US); SIMMONS CARL R (US))</p> <p>13 January 2000 (2000-01-13)</p> <p>abstract</p> <p>page 4, line 1 - line 20</p> <p>Seq Id Nos 3,4</p> <p style="text-align: center;">-----</p>	1-23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/30181

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9804586 A	05-02-1998	AU 3702897 A	20-02-1998
		CA 2260363 A	05-02-1998
		CN 1231673 A	13-10-1999
		EP 0917536 A	26-05-1999

WO 0001722 A	13-01-2000	AU 4862699 A	24-01-2000
		AU 4971299 A	24-01-2000
		WO 0001721 A	13-01-2000
